GENERIC NAME: **EPINEPHRINE HCl**
112.12

BRAND NAME: Adrenalin
CLASS: sympathomimetic

Mechanism of Action:

Pharmacological Effects: Direct acting a and ß agonist; a-bronchial, cutaneous, renal, and visceral arterial constriction (increased systemic vascular resistance); $ß_1$-positive inotropic and chronotropic actions (increases myocardial workload and oxygen requirements), increases automaticity and irritability; $ß_2$ bronchial smooth muscle relaxation and dilation of skeletal vasculature. Other**:** blocks histamine release
Clinical Effects: Cardiac Arrest-increases cerebral and myocardial perfusion pressure; increases systolic and diastolic blood pressures; increases electrical activity in the myocardium; can stimulate spontaneous contractions in asystole. Bradycardia-increases heart rate, increases BP; Bronchospasm/Anaphylaxis-reverse signs/symptoms

Indications and Field Use:

Cardiac arrest - VF/Pulseless VT; asystole; PEA (First line pharmacologic agent for any pulseless dysrhythmia in cardiopulmonary arrest).
Severe bronchospasm, i.e., bronchiolitis, asthma.
Anaphylaxis.
Bradycardia, refractory with profound hypotension, monitored patient only.
Hypotension unresponsive to other therapy, monitored patient only.

Contraindications:

None known for cardiac arrest
Hypothermia, relative contraindication

Adverse Reactions:

CV: Hypertension, ventricular dysrhythmias; tachycardia; angina
CNS: Anxiety, agitation
GI: Nausea/vomiting

NOTES ON ADMINISTRATION

Incompatibilities/Drug Interactions:

Potentiates other sympathomimetics.
Reacts with alkaline solutions, such as sodium bicarbonate, should not be mixed with alkaline agents.

Adult Dosage:

IV for Cardiac Arrest - VF/Pulseless VT, asystole, PEA: Use 1:10,000 solution and give 1.0 mg every 3-5 minutes flushing each with 20 ml of IV fluid, or,
ET for Cardiac Arrest - VF/Pulseless VT, asystole, PEA: Give 2.0 - 2.5 mg via the ET tube.
May use 1:10,000 or dilute 1:1000 to equal 10 ml via ET tube for adult. (i.e., 2 mg of 1:1000 epinephrine diluted with 8 ml NS in a 10 ml syringe)

Continuous Infusion during Cardiac Arrest or profound Bradycardia: 1 mg every 3-5 minutes. Add 30 mg epinephrine to 250 ml NS to run at 100 ml/hr (same as 1 mg every 3 minutes) or titrated to desired hemodynamic end point. Central line preferred, patency of line must be assured.

Continuous Infusion for Hypotension or Symptomatic Bradycardia: 1 mg added to 500 ml of NS administered at 1 μg/min titrated to desired hemodynamic response (range 2-10 μg/min); not first-line therapy.

Anaphylaxis and asthma: Give 0.1- 0.3 mg of 1:1000 solution SC, IM or inject SL; or in extreme cases only, may be asked to use 1:10,000 solution and give 0.1 mg, q 30-60 sec. **IV**, titrated to effect in patients without cardiovascular collapse, or give 0.3 - 0.5 mg ET or IV if cardiovascular collapse is present.

Pediatric Dosage: (Cardiac arrest includes VF/Pulseless VT, Asystole, PEA)

IV/IO Initial Dose for Cardiac Arrest or Refractory Bradycardia: 0.01 mg/kg of 1:10,000.
ET Initial Dose for Cardiac Arrest or Refractory Bradycardia: 0.1 mg/kg of 1:1000; diluted with NS to a volume of 3-5 ml prior to instillation or followed with flush of 3-5 ml of NS after instillation.
IV/IO/ET Repeat Dose Cardiac Arrest: 0.1 mg/kg of 1:1000; dilute with 3-5 ml of NS.
Repeat Dose Refractory Bradycardia: Same dose every 3-5 min. See: Special Notes section.
Asthma/anaphylaxis: Use 1:1,000 solution; give 0.01 mg/kg SC (maximum of 0.35 mg/dose).
IV Infusion: 0.1 μg/kg/min; to prepare for small children 0. 6 x body wt. in kg = mg added to NS to make 100 ml. With this mixture, 1 ml/hr delivers 0.1 μg/kg/min.

Neonatal Dose for First 12 hours of life:

IV/IO/ET Initial and Repeat Dose for Cardiac Arrest or Refractory Bradycardia: 0.01-0.03 mg/kg of 1:10,000 every 3-5 minutes
Repeat Dose Consideration for ET Epinephrine: 0.1 mg/kg of 1:1000 solution if neonate has no vascular access, fails to respond to positive pressure ventilation with 100% O_2, and standard epinephrine dose by the ET tube

Routes of Administration:

Cardiac: IV push, IV infusion, ET, or IO (pediatric patients up to 6 years of age)
Asthma/anaphylaxis/bronchiolitis: SC, SL injection, IM, IV, ET, IO
Infusion pump required for IV infusions in interfacility transfers

Onset of Action:

Seconds

Peak Effects:

Minutes

Duration of Action:

Several minutes

Dosage Forms/Packaging:

1:10,000 solution 1 mg/10 ml prefilled syringes
1:1,000 solution 1 mg/1 ml ampule or prefilled syringes; 30 mg/30 ml vial

Arizona Drug Box Supply Range:

PARAMEDIC and QUALIFIED IEMT:	1:10,000 prefilled syringes x 6 - 8 1:1000 ampules or prefilled syringes x 1 - 2 1:1000 multidose vial x 1 - 2
INTERMEDIATE	1:1000 ampules or prefilled syringes x 1 - 2 1:10,000 prefilled syringes x 3 - 6

Special Notes:

> Total dose for an adult ET (drug plus diluting solution) should equal at least 10 ml to ensure that the drug reaches lung tissue rather than remaining in the tube. Pediatric patient should equal 3 - 5 ml.
> Multi-dose Vial: 1 mg/ml (1:1000) in 30 ml bottle. May be used for administering the ACLS doses of epinephrine down the endotracheal tube (2-2.5 times the peripheral route dose, diluted with 8 ml NS to make a 1:10,000 solution) or for mixing an epinephrine infusions such as 30 mg/250 ml NS.
> Pediatric: If first dose given ET, then IV established, begin at initial IV dose for next dose.
> Data is inadequate to evaluate the safety of high dose epinephrine in newborns; may lead to prolonged hypertension and resultant complications such as Intra cranial hemorrhage in preterm infants.

> Infusions: An infusion pump is required for interfacility transports. A minimum of microdrip tubing is required for field use.